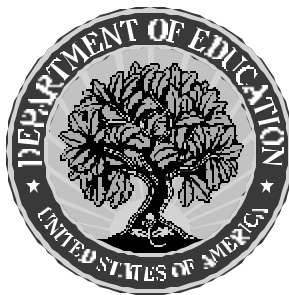


**POST YEAR 2000 ROLLOVER
EVALUATION SURVEY OF THE
EDUCATION SECTOR**

U.S Department of Education



February 2, 2000

On December 9, the U.S. Department of Education issued a Task Order to Westat to conduct a post January 1st random sample, phone survey of elementary/secondary school districts (1,200), postsecondary institutions (1,600), and all minority serving postsecondary institutions (342), between January 15 and February 15, 2000. In an effort to obtain information on the status of Y2K problems at the turn of the New Year, ED requested that Westat conduct a quick random phone survey of 10 school districts and 10 postsecondary institutions between January 3 and 7, 2000.

ED then revised this request to conduct a quick random survey of 50 school districts and 50 postsecondary institutions on the first two business days of the New Year (January 3 and 4). The survey found that elementary/secondary school districts and postsecondary institutions experienced few, if any, Y2K problems.

Specific elementary/secondary school district findings included (Table 1 provides detailed information):

- ◆ Eight percent of the nation's school districts delayed normal school opening as a planned Y2K precaution. None of these districts experienced Y2K problems;
- ◆ All school districts reported that they did not experience any Y2K problems with their Mission-Critical Systems;
- ◆ School districts reported few Y2K problems at the start of the New Year. Districts did not experience any problems with their Central Administration system, while 1% reported problems with Student Services Systems and 3% with Infrastructure systems - one district reported that an older water heater malfunctioned and had to be reset manually, another reported that an outdated personal computer displayed an incorrect date that was fixed with a Y2K software patch;
- ◆ All school districts reported that their Central Administration, Student Services, and Infrastructure systems were *functioning normally* in early January; and
- ◆ The majority of districts (58%) did not have an Independent Validation and Verification (IV&V) performed on their Mission-Critical systems.

Specific postsecondary institution findings included (Table 2 provides detailed information):

- ◆ All institutions opened as normal [It should be noted that at the time the survey was conducted many students had not returned to school from the winter break. However, administrative staff had returned to work and most computer systems were activated during the survey period.];
- ◆ 98% of institutions reported that they did not experience any Y2K problems with their Mission-Critical Systems;
- ◆ Most institutions did not encounter Y2K problems with their major technology systems. Two percent of institutions reported that they experienced Y2K problems with their Central Administration and Student Services systems, including a PC that displayed incorrect dates and difficulty receiving student records. Both of these problems were resolved within a 24-hour period. None of the postsecondary institutions reported problems with Infrastructure systems;

- ◆ All institutions reported that their Central Administration, Student Services, and Infrastructure systems were *functioning normally* in early January; and
- ◆ The majority of the institutions (63%) did not have an IV&V performed on their Mission-Critical systems.

The ED survey findings corresponded with those from a survey by the Council of Great City Schools conducted during the same period. All of the 53 big-city districts reported that they had no major problems with their centralized or school-based systems. Furthermore, an exhaustive search of national and local newspapers turned up few stories about Y2K problems in the educational sector. Given these findings, ED decided to discontinue the larger survey of districts and postsecondary institutions that was scheduled for mid-January.

Methodology

In September 1999, the U.S. Department of Education (ED) contracted with Westat to conduct a telephone survey on the Y2K readiness of our nation's public school districts and postsecondary institutions. The purpose of the survey was to determine the degree of Y2K preparedness of districts and to identify areas in need of assistance.

Westat sampled 1,200 school districts using the National Center of Education Statistics' 1997-98 Common Core of Data as the sampling frame. The survey was conducted from September 2 through October 8, 1999, and closed with an 82 percent response rate.

For the postsecondary sector, Westat sampled 1,600 non-minority-serving institutions in the U.S., Puerto Rico, and the Virgin Islands. Westat researchers conducted the survey from September 13 through October 11, 1999, and achieved an 84 percent response rate for the survey. In addition, Westat surveyed the universe of 339 minority-serving postsecondary institutions between September 8 and October 15, 1999, and closed with a 90 percent response rate for Historically Black Colleges and Universities, 88 percent for Hispanic Serving Institutions, and 94 percent for Tribal institutions.

Westat used the respondents (i.e., those who completed the survey) from the fall survey as the frame for the pilot of school districts and postsecondary institutions. Westat contacted by phone more than 140 respondents in order to obtain the 50 completed surveys in each education sector. Over the 2-day period, Westat completed interviews with 53 school districts and 59 postsecondary institutions slightly surpassing the target of 50 respondents for each sector. In addition, 38 districts and 35 postsecondary institutions mailed their completed surveys to ED after the January 3 and 4 survey. In total, Westat received completed surveys through various means for 91 elementary and secondary school districts and 94 postsecondary institutions. The results from these surveys have been included in the final tabulations. Copies of the survey instruments are provided in Appendix A. Definitions of survey terms can be found in Appendix B.

Given the quick turnaround nature of the request and the relatively small number of respondents, Westat was not able to draw a statistically sound sample of districts and postsecondary institutions. The results were not weighted to provide national estimates. However, the respondent list included districts and institutions from all strata (for example, enrollment size and type of institution) in the original sampling frame and from all regions across the country. The lack of variation in the responses (with the exception of the IV&V question) and validation with other independent sources suggests that the pilot produced an accurate picture of Y2K operations in the educational sector following December 31.

TABLE 1
POST YEAR 2000 ROLLOVER SURVEY OF
ELEMENTARY/SECONDARY SCHOOL DISTRICTS
January 21, 2000

	YES	NO	NO RESPONSE
1. Did your school district delay normal January 2000 school opening? ^{a/}	8%	92%	
If YES , was delayed opening: Planned as a Y2K precaution;	100%	--	
Due to Y2K difficulties; or			
Due to other reason(s)?			
2. Did school district's Mission-Critical Systems (e.g., system that is essential to a core business activity or process, etc.) experience Y2K problems?	--	100%	
3. Was an IV&V performed on Mission-Critical Systems prior to January 1 st ?	42%	58%	
4. Has school district's Central Administration systems (e.g., accounting/finance, payroll, personnel, etc.) experienced Y2K problems?	--	100%	
5. Has school district's Student Services (e.g., student records, food services, bus/transportation, etc.) experienced Y2K problems?	1%	99%	
6. Has school district's Infrastructure (e.g., building/security, heating/AC, telecommunications, etc.) experienced Y2K problems?	3%	97%	
CURRENT OPERATIONAL STATUS OF SCHOOL DISTRICT'S SYSTEMS	GREEN	AMBER	RED
7. What is current operational status of school district's Mission-Critical Systems ?	100%		
8. What is current operational status of district's Central Administration Systems ?	100%		
9. What is current operational status of school district's Student Services ?	100%		
10. What is current operational status of school district's Infrastructure ?	100%		
GREEN: System(s) is (are) operational – <i>functioning normally</i> . AMBER: System(s) has (have) experienced problems(s) and is (are) operating at <i>reduced capacity</i> . RED: System(s) has (have) experienced critical failure(s) and is (are) <i>off-line, unavailable for use</i> .			

NUMBER SCHOOL DISTRICTS RESPONDING: 91 (53 by telephone; 38 mailed their survey responses).

^{a/} Question 1 was asked only of the 53 respondents contacted by telephone.

TABLE 2
POST YEAR 2000 ROLLOVER SURVEY OF
POSTSECONDARY INSTITUTIONS
January 21, 2000

	YES	NO	NO RESPONSE
1. Did your institution delay normal January 2000 school opening? ^{a/}	--	100%	
If YES , was delayed opening: Planned as a Y2K precaution;			
Due to Y2K difficulties; or			
Due to other reason(s)?			
2. Did your institution's Mission-Critical Systems (e.g., system that is essential to a core business activity or process, etc.) experience Y2K problems?	2%	98%	
3. Was an IV&V performed on Mission-Critical Systems prior to January 1 st ?	37%	63%	
4. Has institution's Central Administration (e.g., accounting/finance, payroll, personnel, etc.) systems experienced Y2K problems?	2%	98%	
5. Has institution's Student Services (e.g., student records, food services, transportation, etc.) experienced Y2K problems?	2%	98%	
6. Has institution's Infrastructure (e.g., building/security, heating/AC, telecommunications, etc.) experienced Y2K problems?	--	100%	
CURRENT OPERATIONAL STATUS OF INSTITUTION'S SYSTEMS	GREEN	AMBER	RED
7. What is current operational status of institution's Mission-Critical Systems ?	100%		
8. What is current operational status of Central Administration Systems ?	100%		
9. What is current operational status of institution's Student Services ?	100%		
10. What is current operational status of institution's Infrastructure ?	100%		
GREEN: System(s) is (are) operational – <i>functioning normally</i> . AMBER: System(s) has (have) experienced problems(s) and is (are) operating at <i>reduced capacity</i> . RED: System(s) has (have) experienced critical failure(s) and is (are) <i>off-line, unavailable for use</i> .			

NUMBER INSTITUTIONS RESPONDING: 94 (59 by telephone; 35 mailed their survey responses).

^{a/} Question 1 was asked only of the 59 respondents contacted by telephone.

APPENDIX A

SURVEY INSTRUMENTS



UNITED STATES DEPARTMENT OF EDUCATION

400 Maryland Avenue, SW
Washington, D.C. 20202-4110

December 16, 1999

Superintendent of Schools/LEA

Address line 1

Address line 2

Address line 3

Dear Superintendent:

Earlier this year, the Department of Education conducted two national Y2K assessment surveys of the education sector. These assessment surveys raised major concerns about the Y2K readiness of our nation's schools. The Department's most recent survey, completed in October, showed more than one-third of the nation's school districts were not fully Y2K compliant and four percent indicated they did not believe they would be ready by January 1st. Survey results are posted on the Department's web site (<http://www.ed.gov/y2k/reports.html>).

I am writing you today to request your school district's participation in a Y2K rollover evaluation survey of the elementary/secondary education community. The purpose of this survey is to evaluate the 'Y2K health' of the nation's school districts after the New Year. The Department's contractor, Westat, will be conducting this random-sample survey by telephone. For the results of this survey to truly represent the post Y2K status of your schools, it is important that the most senior representative who is knowledgeable about your school district's Y2K status respond to this survey. A printed copy of the survey instructions and questions are enclosed.

Your school district's participation in this survey is important to enable this study to provide the nation with accurate and complete information. Your school district's response to this survey will be kept strictly confidential. A Westat interviewer will call your Y2K Coordinator between mid-January and mid-February to get responses to the seven-question survey. It should take just a few minutes. Survey results will be available in early March 2000 at the Department's web site referenced above.

If you have any questions regarding this survey, please telephone Westat at 1-800-289-0135. Thank you in advance for your participation in this important post Y2K evaluation survey.

Sincerely,

A handwritten signature in black ink, appearing to read "Marshall Smith", is written above the typed name.

Marshall Smith
Deputy Secretary (A)
U. S. Department of Education

Enclosures

ID #

**POST JANUARY 1, 2000 ROLLOVER SURVEY OF
ELEMENTARY/SECONDARY EDUCATION**

Survey Instructions

Please review the instructions and the survey form. Westat, the Department's contractor, will call for your survey answers.

ABOUT THIS SURVEY: The U.S. Department of Education is conducting this telephone follow-up survey to evaluate the status of the nation's elementary/secondary schools after January 1, 2000. Your school district was selected at random for this survey. Information obtained from this survey will help assess the status of the elementary/secondary education community after the year 2000 transition. Please designate the most senior representative who is knowledgeable about your school district's Y2K status to answer the survey when Westat, Department's contractor, begins calling school districts in mid-January.

CONFIDENTIALITY STATEMENT: All reports on the data collected from this survey will be in aggregate form to protect your confidentiality. Individual school districts will never be identified. Your response to the survey will NOT affect your school district's eligibility for grants or funding. Federal legislation protects you from liability claims related to good-faith information sharing about Y2K.

SURVEY DETAILS: Please be prepared to answer all of the questions when Westat telephones you between mid-January and mid-February. Results of this survey will be posted on the Department's web site (<http://www.ed.gov/y2k/reports.html>) in early March 2000.

QUESTIONS ABOUT THE SURVEY? If you have questions regarding the survey, please contact Westat at **1-888-925-5829**. Your questions will be answered within two business days. Thank you for participating in this survey.

Office of Management and Budget Approval and Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid Office of Management and Budget (OMB) control number. The valid OMB control number for this information collection is **1890-0003**. Approval expires: **03/31/2000**. The estimated time required to respond to the 8-**question telephone survey** is approximately **5 minutes**. The time required to collect the information necessary to complete the survey is estimated to take 30 minutes. Information collection includes the time used to review instructions, search existing data resources, and gather data. The total time required to complete this information collection is estimated to take approximately 35 minutes. **If you have any comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to:** U.S. Department of Education, Washington, D.C. 20202-4651. **If you have comments or concerns regarding the status of your individual response/submission of this form, write directly to:** U.S. Department of Education, Year 2000 Team, ATTN: Kent H. Hannaman, 400 Maryland Avenue, S.W., FB6, Room 4C157, Washington, D.C. 20202-4110.

POST JANUARY 1, 2000 ROLLOVER SURVEY OF ELEMENTARY AND SECONDARY EDUCATION

Name of school district _____ Date: ____/____/2000

MISSION-CRITICAL SYSTEM: An information system that is essential to a core business activity or process.

INDEPENDENT VERIFICATION AND VALIDATION (IV&V): Year 2000 IV&V is a process whereby an organization, independent of the system's developers, reviews a system's conversion and test plans, test scripts, and test results to assure that the system developers have taken all appropriate actions to identify and correct Y2K problems.

CURRENT OPERATIONAL STATUS COLOR CODES:

GREEN – system(s) is (are) functioning normally.

AMBER – system(s) has (have) experienced problem(s) and the system(s) is (are) operating at *reduced capacity*.

RED – system(s) has (have) experienced critical failure(s) and the system(s) is (are) off-line - *unavailable* for use.

Please check the box of the most appropriate answer. Fill in MONTH/DAY as needed.

1. Did your school district delay normal January 2000 school opening?

If **Yes**, was delayed opening: _____ Planned as a Y2K precaution;
 _____ Due to Y2K difficulties; or
 _____ Due to other reason(s)?

☐ Yes ☐ No

2. Has your school district's **Mission-Critical Systems** experienced **Y2K** problems?

☐ Yes ☐ No

3. Was an **Independent Verification and Validation** performed on your Mission-Critical Systems prior to January 1, 2000?

☐ Yes ☐ No

4. Has your school district's **Central Administration** (e.g., accounting/finance, payroll, personnel, etc.) systems experienced **Y2K** problems?

☐ Yes ☐ No

5. Has your school district's **Student Services** (e.g., student records, food services, bus/transportation, etc.) experienced **Y2K** problems?

☐ Yes ☐ No

6. Has your school district's **Infrastructure** (e.g., building/security, heating/AC, telecommunications, etc.) experienced **Y2K** problems?

☐ Yes ☐ No

7. What is the current operational status of your school district's Mission-Critical Systems? If **AMBER** or **RED**, when do you expect operational status will be **GREEN**?

☐ **GREEN** ☐ **AMBER** ☐ **RED**

(MO/DA) _____/_____

8. Please indicate the **current** operational status for each of the following system categories:

Central Administration (e.g., accounting/finance, payroll, personnel) operational status? If **AMBER** or **RED**, when do you expect operational status will be **GREEN**?

☐ **GREEN** ☐ **AMBER** ☐ **RED**

(MO/DA) _____/_____

Student Services (e.g., student records, food services, bus/transportation) operational status? If **AMBER** or **RED**, when do you expect operational status will be **GREEN**?

☐ **GREEN** ☐ **AMBER** ☐ **RED**

(MO/DA) _____/_____

Infrastructure (e.g., building/security, heating/AC, telecommunications) operational status? If **AMBER** or **RED**, when do you expect operational status will be **GREEN**?

☐ **GREEN** ☐ **AMBER** ☐ **RED**

(MO/DA) _____/_____



UNITED STATES DEPARTMENT OF EDUCATION

400 Maryland Avenue, SW

Washington, D.C. 20202-4110

December 15, 1999

President/Chancellor

Address line 1

Address line 2

Address line 3

Dear President/Chancellor:

Earlier this year, the Department of Education conducted two national Y2K assessment surveys of the education sector. These assessment surveys raised major concerns about the Y2K readiness of our nation's schools. The Department's most recent survey, completed in October, showed more than one-third of the nation's postsecondary institutions were not fully Y2K compliant and three percent indicated they did not believe they would be ready by January 1st. Survey results are posted on the Department's web site (<http://www.ed.gov/y2k/reports.html>).

I am writing you today to request your institution's participation in a post Y2K rollover evaluation survey of the postsecondary education community. The purpose of this survey is to evaluate the 'Y2K health' of the nation's postsecondary institutions after the New Year. The Department's contractor, Westat, will be conducting this random-sample survey by telephone. For the results of this survey to truly represent the post Y2K status of your institution, it is important that the most senior representative who is knowledgeable about your institution's Y2K status respond to this survey. A printed copy of the survey instructions and questions are enclosed.

Your institution's participation in this survey is important to enable this study to provide the nation with accurate and complete information. Your institution's response to this survey will be kept strictly confidential. A Westat interviewer will call your Y2K Coordinator between mid-January and mid-February to get responses to the seven-question survey. It should take just a few minutes. Survey results will be available in early March 2000 at the Department's web site referenced above.

If you have any questions regarding this survey, please telephone Westat at 1- 800-289-0135. Thank you in advance for your participation in this important post Y2K evaluation survey.

Sincerely,

A handwritten signature in black ink, appearing to read "Marshall Smith", is written above the typed name.

Marshall Smith

Deputy Secretary (A)

U. S. Department of Education

Enclosures

ID #

POST JANUARY 1, 2000 ROLLOVER SURVEY OF POSTSECONDARY EDUCATION

Survey Instructions

Please review the instructions and the survey form. Westat, the Department's contractor, will call for your survey answers.

ABOUT THIS SURVEY: The U.S. Department of Education is conducting this telephone follow-up survey to evaluate the status of the nation's postsecondary institutions after January 1, 2000. Your institution was selected at random for this survey. Information obtained from this survey will help assess the status of the postsecondary education community after the year 2000 transition. Please designate the most senior representative who is knowledgeable about your institution's Y2K status to answer the survey questions when Westat, the Department's contractor, begins calling institutions in mid-January.

CONFIDENTIALITY STATEMENT: All reports on the data collected from this survey will be in aggregate form to protect your confidentiality. Individual institutions will never be identified. Your response to the survey will NOT affect your institution's eligibility for grants or funding. Federal legislation protects you from liability claims related to good-faith information sharing about Y2K.

SURVEY DETAILS: Please be prepared to answer all of the questions when Westat telephones you between mid-January and mid-February. Results of this survey will be posted on the Department's web site (<http://www.ed.gov/y2k/reports.html>) in early March 2000.

QUESTIONS ABOUT THE SURVEY? If you have questions regarding the survey, please contact Westat at **1-888-925-5829**. Your questions will be answered within two business days. Thank you for participating in this survey.

Office of Management and Budget Approval and Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid Office of Management and Budget (OMB) control number. The valid OMB control number for this information collection is **1890-0003**. Approval expires: **03/31/2000**. The estimated time required to respond to the 8-**question telephone survey** is approximately **5 minutes**. The time required to collect the information necessary to complete the survey is estimated to take 30 minutes. Information collection includes the time used to review instructions, search existing data resources, and gather data. The total time required to complete this information collection is estimated to take approximately 35 minutes. **If you have any comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to:** U.S. Department of Education, Washington, D.C. 20202-4651. **If you have comments or concerns regarding the status of your individual response/submission of this form, write directly to:** U.S. Department of Education, Year 2000 Team, ATTN: Kent H. Hannaman, 400 Maryland Avenue, S.W., FB6, Room 4C157, Washington, D.C. 20202-4110.

POST JANUARY 1, 2000 ROLLOVER SURVEY OF POSTSECONDARY EDUCATION

Name of institution _____ Date: ____/____/2000

MISSION-CRITICAL SYSTEM: An information system that is essential to a core business activity or process.

INDEPENDENT VERIFICATION AND VALIDATION (IV&V): Year 2000 IV&V is a process whereby an organization, independent of the system's developers, reviews a system's conversion and test plans, test scripts, and test results to assure that the system developers have taken all appropriate actions to identify and correct Y2K problems.

CURRENT OPERATIONAL STATUS COLOR CODES:

GREEN – system(s) is (are) functioning normally.

AMBER – system(s) has (have) experienced problem(s) and the system(s) is (are) operating at *reduced capacity*.

RED – system(s) has (have) experienced critical failure(s) and the system(s) is (are) off-line - *unavailable* for use.

Please check the box of the most appropriate answer. Fill in MONTH/DAY as needed.

- | | |
|---|--|
| <p>1. Did your institution delay normal January 2000 school opening?
If Yes, was delayed opening: _____ Planned as a Y2K precaution;
_____ Due to Y2K difficulties; or
_____ Due to other reason(s)?</p> | <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> |
| <p>2. Has your institution's Mission-Critical Systems experienced Y2K problems?</p> | <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> |
| <p>3. Was an Independent Verification and Validation performed on your Mission-Critical Systems prior to January 1, 2000?</p> | <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> |
| <p>4. Has your institution's Central Administration (e.g., accounting/finance, payroll, personnel) systems experienced Y2K problems?</p> | <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> |
| <p>5. Has your institution's Student Services (e.g., student records, food services, bus/transportation) experienced Y2K problems?</p> | <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> |
| <p>6. Has your institution's Infrastructure (e.g., building/security, heating/AC, telecommunications, etc.) experienced Y2K problems?</p> | <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> |
| <p>7. What is the current operational status of your institution's Mission-Critical Systems?
If AMBER or RED, when do you expect operational status will be GREEN?</p> | <p><input type="checkbox"/> GREEN <input type="checkbox"/> AMBER <input type="checkbox"/> RED
(MO/DA) _____/_____</p> |
| <p>8. Please indicate the current operational status for each of the following system categories:</p> <p>Central Administration (e.g., accounting/finance, payroll, personnel) operational status?
If AMBER or RED, when do you expect operational status will be GREEN?</p> | <p><input type="checkbox"/> GREEN <input type="checkbox"/> AMBER <input type="checkbox"/> RED
(MO/DA) _____/_____</p> |
| <p>Student Services (e.g., student records, student financial aid, food services) operational status? If AMBER or RED, when do you expect operational status will be GREEN?</p> | <p><input type="checkbox"/> GREEN <input type="checkbox"/> AMBER <input type="checkbox"/> RED
(MO/DA) _____/_____</p> |
| <p>Infrastructure (e.g., building/security, heating/AC, telecommunications) operational status? If AMBER or RED, when do you expect operational status will be GREEN?</p> | <p><input type="checkbox"/> GREEN <input type="checkbox"/> AMBER <input type="checkbox"/> RED
(MO/DA) _____/_____</p> |

APPENDIX B

SURVEY DEFINITIONS

Independent Verification and Validation (IV&V): Year 2000 IV&V is a process whereby an organization, independent of the system's developers, reviews a system's conversion and test plans, test scripts, and test results to assure that the system developers have taken all appropriate actions to identify and correct Y2K problems.

Current Operational Status Color Codes:

GREEN – system(s) is (are) functioning normally.

AMBER – system (s) has (have) experienced problem(s) and the system(s) is (are) operating at *reduced capacity*.

RED - system (s) has (have) experienced critical failure(s) and the system(s) is (are) off-line - *unavailable* for use.

Mission-Critical System An information system that is essential to a core business activity or process.

Year 2000 Problem The potential obstacle and its variations that might be encountered in any level of computer hardware and software from microcode to application programs, files, and databases that need to correctly interpret year-date data represented in 2-digit-year format.

The Y2K problem resulted from a common programming practice, begun in the 1960s, to represent dates with six digits instead of eight (010198 vs. 01011998). This short hand saved disk space and thus money. Unfortunately, because the first two digits of the year are omitted, programs assume that each date entry is date in the 20th century. No one imagined that the software programs created then would still be in use in 2000. The problem is exacerbated by the fact that dates are located everywhere in programs, and no one can forecast how an application will respond to dates from other centuries without evaluation and analysis.